

ALEXANDER et al  
Appl. No. 10/523,396  
January 17, 2007

**AMENDMENTS TO THE CLAIMS:**

Please amend claim 22 as follows.

This listing of claims will replace all prior versions, and listings, of claims in the application:

1. -16 (cancelled)
17. (previously presented) A method as claimed in claim 22 wherein the step of calibrating the first magnetic field sensing device comprises using a correction model.
18. (previously presented) A method as claimed in claim 22 wherein the correction model comprises a gain term and an offset term.
19. (previously presented) A method as claimed in claim 22 wherein the estimator algorithm comprises an extended Kalman filter algorithm.
20. (previously presented) A method as claimed in claim 22 further comprising the step of continually deriving the most likely position of the position sensor relative to the object in real time.
21. (cancelled)

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22. (currently amended) A method of determining a drilling location on a wing skin, such that a ~~bolt~~an attachment hole can be drilled through the wing skin and a supporting structure, the method comprising the steps of:

(a) placing an object having an associated magnetic field on the supporting structure at the drilling location;

(b) locating a position sensor on the wing skin, the position sensor comprising first and second magnetic field sensing devices, said first magnetic field sensing device located at a first position and the second magnetic field sensing device located at a second position, said second position different from said first position;

(c) calibrating the first magnetic field sensing device, thereby deriving a first calibration;

(d) calibrating the second magnetic field sensing device, thereby deriving a second calibration;

(e) predicting the associated magnetic field using a mathematical model to obtain a predicted magnetic field;

(f) sensing a first signal related to the magnetic field at the first position from the first magnetic field sensing device, and using the first calibration to derive a first measured magnetic field from the first signal;

(g) sensing a second signal related to the magnetic field at the ~~first~~second position from the ~~first~~second magnetic field sensing device, and using the second calibration to derive a second measured magnetic field from the second signal;

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(h) comparing the predicted magnetic field with the first and second measured magnetic fields using an estimator algorithm, thereby calculating a most likely position of the object relative to the position sensor;

(i) maneuvering the position sensor on the wing skin towards the calculated most likely position; and

(j) repeating steps (f) to (i) above, until the drilling location is determined; and

(k) drilling said attachment hole at said drilling location.

23. (previously presented) The method according to claim 22, wherein the step of calibrating the first magnetic field sensing device comprises the step of placing the position sensor at a known position relative to the object, in said known position the position sensor is separated from the object by a wing skin of predetermined thickness.

24. (previously presented) The method according to claim 22, wherein the object comprises a cylindrical magnetic object.

25. (previously presented) The method according to claim 22, wherein the magnetic field sensing devices comprise Hall effect sensing devices.

26. (previously presented) A portable device for performing the method of claim 22.

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27. (previously presented) A computer program product comprising a readable storage medium containing computer readable instructions for controlling a computer to perform steps (c) through (h) of the method of claim 22.